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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,831	12/09/2003	Hei Ming Shiu	SC13152HP	4401
23125	7590	07/05/2005	EXAMINER	
FREESCALE SEMICONDUCTOR, INC. LAW DEPARTMENT 7700 WEST PARMER LANE MD:TX32/PL02 AUSTIN, TX 78729			PERT, EVAN T	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

Application No.

10/731,831

Applicant(s)

SHIU ET AL.

Examiner

Evan Pert

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 1-25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:
  - At [0002], line 2, “formed on” should read --formed as part of--, for better form.
  - At [0031], line 8, “for form” should read --for forming--, for better grammar.
  - At [0035], line 4, “leave some spots” should read --some spots are--, or an equivalent.

2. Claims 1- 25 are objected to because of the following informalities:

- Use of “ball” to mean “form” (see US 5,751,068, col. 2, lines 62-63)

Applicant’s claim term “ball” to describe a soft conductive shape that is “rectangular” is a contradiction to the plain meaning of “ball” [e.g. p. 7, last sentence].

For example, see US 6,000,603 at col. 7, lines 14-21, where “molten metal sections spheroidize to form balls that are substantially spherical in shape.”

Granted, a “football” is not spherical, but in this case the examiner believes that the word “ball” is less preferable than the word “form” in the original claims, meaning that the “conductive forms” that are “transferred” from a “fixture” to a “molding masking tape” are preferably “ball” or coined ball shapes (i.e. barrel shapes), but could be any shape such as shapes indicated in US 5,751,068, col. 2, lines 62-63, where “solder forms” can be “shaped as balls, cylinders, polygonal boxes, barrels or hour glasses.”

Since the shape of the forms 14 transferred to the mold masking tape is not a critical feature to the claimed invention of this case, the examiner deems the term “ball” in the claims less preferable than the term “form” under 35 CFR 1.71.

The following changes should be entered to place the application in better form, without introducing new matter and without altering claim scope as originally filed:

At [0022], line 1, change "balls" to --forms (e.g. balls)--.

At [0031], line 23, change "shaped balls" to --shaped forms--.

At [0031], line 23, change "rectangular ball" to --rectangular form--.

In claim 1, lines 3, 4, 6, 11, 15 and 17, change "balls" to --forms--.

In claim 1, line 17, change "of the" to --among the--.

In claim 2, line 2, change "balls" to --forms--.

In claim 3, line 2, change "balls" to --forms--.

In claim 4, line 2, change "balls forming step includes a mechanical" to --the forms undergo a mechanical—and in line 3, change "balls" to --forms--.

In claim 4, line 3; claim 5, line 2, change "balls" to --forms--.

In claim 6, line 2, delete "the step of".

In claim 7, line 3; claim 8, line 3; claim 9, line 3; claim 11, line 3; claim 14, lines 3, 4, 6, 11, 13, 15, 17; claim 15, line 2; claim 16, line 2, change "balls" to --forms--.

In claim 17, change "balls forming step includes a mechanical" to --the forms undergo a mechanical--.

In claim 17, line 3; claim 18, line 2, change "balls" to --forms--.

In claim 18, change "the step" to --a step--.

In claim 20, line 3; claim 21, line 4; claim 22, line 3; claim 24, lines 2 and 3, change "balls" to --forms--.

Appropriate correction is required.

3. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested:

--Method of forming land grid array packaged device--.

***Allowable Subject Matter***

4. Claims 1-25 are objected to for the unconventional use of "balls" to mean "forms" among some other informalities as noted under item 1 above, but are otherwise allowable.

5. The following is an examiner's statement of reasons for allowance:

The prior art does not disclose applicant's method characterized by steps of: 1) forming soft conductive forms in a fixture, the forms preferably being balls with opposing sides of the balls at least partially flattened 2) transferring the forms from the fixture to a mold masking tape, 3) attaching an IC die to the mold masking tape, 4) electrically connecting die bonding pads to corresponding forms (i.e. "respective ones") on the mold masking tape, 5) encapsulating the IC die, the electrical connections, and a top portion of the forms with a mold compound (i.e. encapsulating the forms where not masked by the mold masking tape), and 6) removing the mold masking tape, such that a bottom portion among the forms is exposed (i.e. the bottom portion of each the forms that was against the mold masking tape is exposed when the mold masking tape is removed).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Each reference in the list of cited art includes some limitations of the claims of the instant invention, yet none of the references alone or in combination legally suggest applicant's method as claimed.

Perhaps the closest prior art to pending claim 1 can be considered as disclosed in US 6,429,043, yet the "terminal supplying tape" 21 in the '043 reference is not formed by "transferring soft conductive forms from a fixture," as claimed in this case, but rather by patterning "metal thin film."

In US 5,273,938, a mold masking tape 12 is removed to expose contacts 13, but these contacts 13 were not "transferred from a fixture" as claimed, for example.

US 6,00,603 discloses forming an array of soft conductive solder balls in a fixture, yet does not transfer balls to a mold masking tape that gets removed to expose bottom portions of the balls through encapsulant of a semiconductor device.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 571-272-1969.

The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP  
June 29, 2005



**EVAN PERT**  
**PRIMARY EXAMINER**